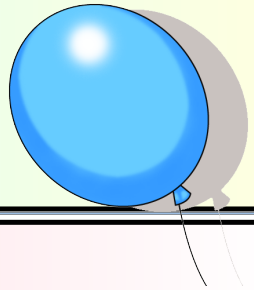
(6) M - Describe how pressure, volume and temperature are related.
(7) S - Describe an investigation to estimate the value of absolute zero
(8) C - Determine the accuracy of a value by qualitative means

Lesson 4. Estimating absolute zero

STARTER: MWB



Kilo 10^3

Mega 10^6

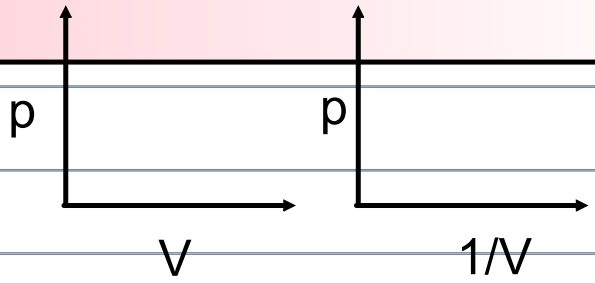
Giga 10^9

Boyles law equation.

Boyle's law definition

~~Boyles law graphs.~~

3 Ideal gas assumptions



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Lesson 4. Estimating absolute zero

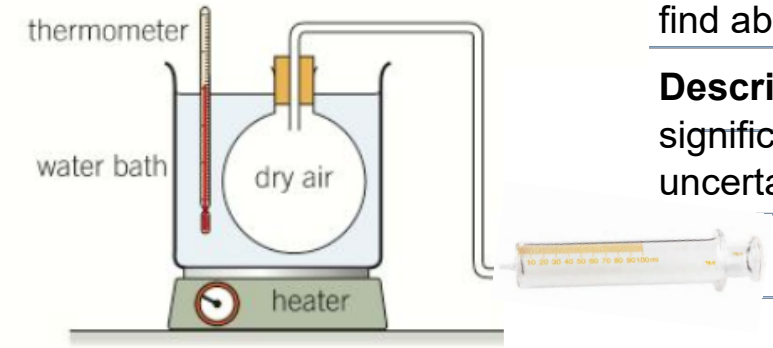
Activity: We can use the idea of charles law OR the pressure law to estimate absolute zero.

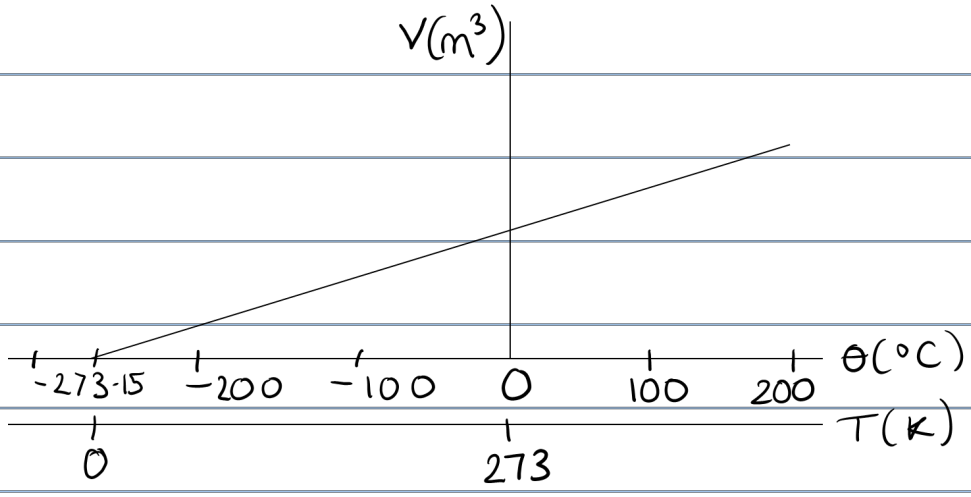
Use your data to plot a graph of P against T (in celcius). Extrapolate your line to find the temperature at which volume is zero.

Sketch the graph of P against T in kelvin.

Describe step by step how your setup could be used to find absolute zero.

Describe and explain a significant source of uncertainty.





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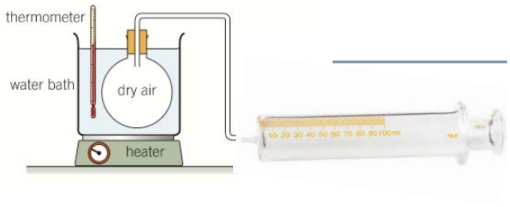
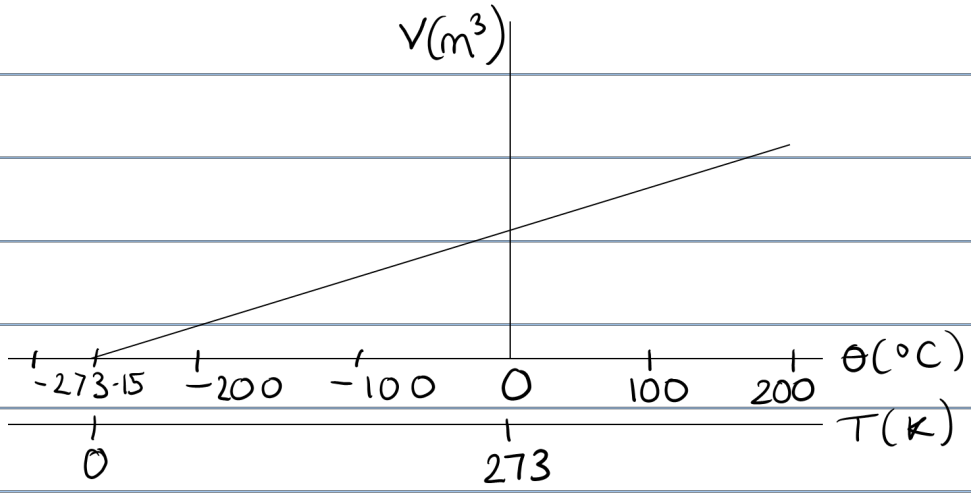
Evaluation

1. Determine the accuracy of your value for absolute zero against the accepted value.
2. Identify areas in your procedure which could contribute to any error.
3. Suggest methods which could improve the accuracy of your result.





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Plenary

In an experiment with helium gas at constant volume, the pressure exerted by the gas is measured at 10 °C intervals from 0 °C to 100 °C. Describe how you would use this data to determine a Celsius value for absolute zero.

[3]

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Answer	Marks
Plot a graph of p against θ / °C using the data	B1
Draw the best fit straight line (through the points)	B1
Extrapolate line to reach $p = 0$, read off temperature at which $p = 0$(AW)	B1


Key point